

(ii) The package as prepared for shipment meets the performance tests prescribed in part 178 of this subchapter for the hazardous materials contained in the package;

(iii) Corrosive materials (except ORM–D) in bottles are further packed in securely closed inner receptacles before packing in outer packagings; and

(iv) For transportation by aircraft, the total net quantity does not exceed the lowest permitted maximum net quantity per package as shown in Column 9a or 9b, as appropriate, of the §172.101 table. The permitted maximum net quantity must be calculated in kilograms if a package contains both a liquid and a solid.

(2) A packaging containing inner packagings of Division 6.2 materials may not contain other hazardous materials, except dry ice.

(i) When a Large Packaging is used for the transportation of liquids with a flash point of 60.5 °C (141 °F) (closed cup) or lower, or powders with the potential for dust explosion, measures must be taken during product loading and unloading to prevent a dangerous electrostatic discharge.

[75 FR 5393, Feb. 2, 2010]

§ 173.37 Hazardous Materials in Flexible Bulk Containers.

(a) No person may offer or accept a hazardous material for transportation in a Flexible Bulk Container except as authorized by this subchapter. Each Flexible Bulk Container used for the transportation of hazardous materials must conform to the requirements of its specification and regulations for the transportation of the particular commodity.

(b) *Initial use and reuse of Flexible Bulk Containers.* A Flexible Bulk Container may be reused. Before a Flexible Bulk Container is filled and offered for transportation, the Flexible Bulk Container must be given an external visual inspection by the person filling the Flexible Bulk Container to ensure:

(1) The Flexible Bulk Container is free from corrosion, contamination, cracks, cuts, or other damage that would render it unable to pass the prescribed design type test to which it is certified and marked; and

(2) The Flexible Bulk Container is marked in accordance with requirements in §178.1010 of this subchapter. Required markings that are missing, damaged or difficult to read must be restored or returned to original condition.

(3) The following components must be examined to determine structural serviceability:

- (i) Textile slings;
- (ii) Load-bearing structure straps;
- (iii) Body fabric; and
- (iv) Lock device parts including metal and textile parts are free from protrusions or damage.

(4) The use of Flexible Bulk Containers for the transport of hazardous materials is permitted for a period not to exceed two years from the date of manufacture of the Flexible Bulk Container.

(c) During transportation—

(1) No hazardous material may remain on the outside of the Flexible Bulk Container; and

(2) Each Flexible Bulk Container must be securely fastened to or contained within the transport unit.

(3) If restraints such as banding or straps are used, these straps must not be over-tightened to an extent that causes damage or deformation to the Flexible Bulk Container.

(4) Flexible Bulk Containers must be transported in a conveyance with rigid sides and ends that extend at least two-thirds of the height of the Flexible Bulk Container.

(5) Flexible Bulk Containers must not be stacked for highway or rail transportation.

(6) Flexible Bulk Containers must not be transported in cargo transport units when offered for transportation by vessel.

(7) Flexible Bulk Containers when transported by barge must be stowed in such a way that there are no void spaces between the Flexible Bulk Containers in the barge. If the Flexible Bulk Containers do not completely fill the barge, adequate measures must be taken to avoid shifting of cargo. The maximum permissible height of the stack of Flexible Bulk Containers must not exceed 3 containers high.

(d) A Flexible Bulk Container used to transport hazardous materials may not

exceed 15 cubic meters (530 cubic feet) capacity.

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§ 173.40 General packaging requirements for toxic materials packaged in cylinders.

When this section is referenced for a Hazard Zone A or B hazardous material elsewhere in this subchapter, the requirements in this section are applicable to cylinders used for that material.

(a) *Authorized cylinders.* (1) A cylinder must conform to a DOT specification or a UN standard prescribed in subpart C of part 178 of this subchapter, except that acetylene cylinders and non-refillable cylinders are not authorized. The use of UN tubes and MEGCs is prohibited for Hazard Zone A materials.

(2) The use of a specification 3AL cylinder made of aluminum alloy 6351-T6 is prohibited for a Division 2.3 Hazard Zone A material or a Division 6.1 Hazard Zone A material.

(3) A UN composite cylinder certified to ISO-11119-3 is not authorized for a Division 2.3 Hazard Zone A or B material.

(4) For UN seamless cylinders used for Hazard Zone A materials, the maximum water capacity is 85 L.

(b) *Outage and pressure requirements.* For DOT specification cylinders, the pressure at 55 °C (131 °F) of Hazard Zone A and Hazard Zone B materials may not exceed the service pressure of the cylinder. Sufficient outage must be provided so that the cylinder will not be liquid full at 55 °C (131 °F).

(c) *Closures.* Each cylinder containing a Hazard Zone A material must be closed with a plug or valve conforming to the following:

(1) Each plug or valve must have a taper-threaded connection directly to the cylinder and be capable of withstanding the test pressure of the cylinder without damage or leakage. For UN pressure receptacles, each valve must be capable of withstanding the test pressure of the pressure receptacle and be connected directly to the pressure receptacle by either a taper thread or other means which meets the requirements of ISO 10692-2: (IBR, see § 171.7 of this subchapter).

(2) Each valve must be of the packless type with non-perforated dia-

phragm, except that, for corrosive materials, a valve may be of the packed type with an assembly made gas-tight by means of a seal cap with gasketed joint attached to the valve body or the cylinder to prevent loss of material through or past the packing.

(3) Each valve outlet must be sealed by a threaded cap or threaded solid plug and inert gasketing material.

(4) The materials of construction for the cylinder, valves, plugs, outlet caps, luting, and gaskets must be compatible with each other and with the lading.

(d) *Additional handling protection.* Each cylinder or cylinder overpack combination offered for transportation containing a Division 2.3 or 6.1 Hazard Zone A or B material must conform to the valve damage protection performance requirements of this section. In addition to the requirements of this section, overpacks must conform to the overpack provisions of § 173.25.

(1) DOT specification cylinders must conform to the following:

(i) Each cylinder with a wall thickness at any point of less than 2.03 mm (0.08 inch) and each cylinder that does not have fitted valve protection must be overpacked in a box. The box must conform to overpack provisions in § 173.25. Box and valve protection must be of sufficient strength to protect all parts of the cylinder and valve, if any, from deformation and breakage resulting from a drop of 2.0 m (7 ft) or more onto a non-yielding surface, such as concrete or steel, impacting at an orientation most likely to cause damage. "Deformation" means a cylinder or valve that is bent, distorted, mangled, misshapen, twisted, warped, or in a similar condition.

(ii) Each cylinder with a valve must be equipped with a protective metal cap, other valve protection device, or an overpack which is sufficient to protect the valve from breakage or leakage resulting from a drop of 2.0 m (7 ft) onto a non-yielding surface, such as concrete or steel. Impact must be at an orientation most likely to cause damage.

(2) Each UN cylinder containing a Hazard Zone A or Hazard Zone B material must have a minimum test pressure in accordance with P200 of the UN Recommendations (IBR, see § 171.7 of